

For each question, you need to find the answer and show your work. Each problem is worth 3 points: one for the correct answer and two for showing your work. For some problems, you may just need to write out how you know you have the correct answer.

1. Simplify.

$$\frac{a^4 \bullet a^7}{a^3 \bullet a^5}$$

2. Simplify.

$$\left(\frac{f^4 \bullet f^2 \bullet f^8 \bullet f^{-4}}{f^2 \bullet f^8 \bullet f^4 \bullet f^3} \right)^4$$

3. Find the value of 5^7 .

4. Estimate $\sqrt{47}$ to the nearest tenth.

5. A company has 325 employees. If that number doubles every four years for the next twelve years, how many employees will the company have at the end of the 12-year period?

6. The number of bacteria in a culture doubles every 15 minutes. If an experiment begins at 9 AM and there are 2000 bacteria at that time, how many bacteria will there be at 11 AM?

7. If $x^2 = 625$, what is the value of \sqrt{x} ?

8. Write 4.3×10^6 in standard notation.

9. Write 5.62×10^{-8} in standard notation.

10. The bee hummingbird of Cuba is the world's smallest bird. It weighs approximately 0.056 oz. What is its weight in scientific notation?

11. Solve for n : $8.16 \times 10^n = .0000000816$

Open-Ended Question: Answer the following question on a separate piece of paper. Make sure as you answer the open-ended question that you show your work AND explain how you know you are doing the correct work. YOU MUST EXPLAIN WHAT YOU ARE DOING!!!

Aside from Australia, the largest island in the world is Greenland, whose approximate area is 8.4×10^5 square miles. The next largest island after Greenland is New Guinea, which has an area of approximately 3.0498×10^5 square miles.

A. Approximately how many times larger than New Guinea is Greenland?

B. What is the approximate difference in the areas of the two islands, written in scientific notation?